WHAT IS CLAIMED IS:

1. An isolated and purified polynucleotide that encodes an opioid receptor polypeptide or opioid receptor-like polypeptide.

2. The isolated and purified polynucleotide of claim 1, wherein said polynucleotide is a DNA segment.

3. The isolated and purified polynucleotide of claim 1, wherein said encoded polypeptide is a mu opioid receptor.

4. The isolated and purified polynucleotide of claim 1, wherein said encoded polypeptide comprises the amino acid residue sequence essentially as set forth in SEQ ID NO:8.

5. The isolated and purified polynucleotide of claim 1, wherein said polynucleotide comprises the nucleotide base sequence of SEQ ID NO:7.

6. The isolated and purified polynucleotide of claim 1, wherein said encoded polypeptide is an opioid receptor-like polypeptide.

7. The isolated and purified polynucleotide of claim 1, wherein said encoded polypeptide comprises the amino acid residue sequence essentially as set forth in SEQ ID NO:17.

8. The isolated and purified polynucleotide of claim 1, wherein said polynucleotide comprises the nucleotide base sequence of SEQ ID NO:16.

9. An isolated and purified polynucleotide comprising a base sequence that is identical or complementary to a segment of at least 35 contiguous bases of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO:7, or SEQ ID NO:16 wherein said polynucleotide hybridizes to a polynucleotide that encodes a mu opioid receptor polypeptide or a gene transcription regulatory polypeptide.

10. The isolated and purified polynucleotide of claim 9, wherein the base sequence is identical or complementary to a segment of at least 50 contiguous bases.

11. The isolated and purified polynucleotide of claim 10, wherein the base sequence is identical or complementary to a segment of at least 75 contiguous bases.

12. The isolated and purified polynucleotide of claim 11, wherein the base sequence is identical or complementary to a segment of at least 100 contiguous bases.

13. The isolated and purified polynucleotide of claim 12, wherein the base sequence is identical or complementary to a segment of at least 125 contiguous bases.

14. The isolated and purified polynucleotide of claim 13, wherein the base sequence is identical or complementary to a segment of at least 150 contiguous bases.

15. The polynucleotide of claim 1, further defined as a vector.

16. The polynucleotide of claim 15, wherein the vector comprises the polynucleotide operatively linked to a prokaryotic promoter.

17. The polynucleotide of claim 15, wherein the vector comprises the polynucleotide linked to a eukaryotic promoter.

18. The polynucleotide of claim 1, wherein the mu opioid receptor coding region is positioned under the control of a promoter.

19. An isolated and purified mu opioid receptor polypeptide.

20. The isolated and purified polypeptide of claim 19 defined as having a K_i for an opioid compound of between 1.0M and 1pM.

21. The isolated and purified polypeptide of claim 20 wherein the K_i is between 10.0nM and 0.1nM.

22. The isolated and purified polypeptide of claim 20 wherein the opioid compounds is selected from the group consisting of morphine, methadone, enkephalins, endorphins, and dynorphins.

23. The isolated and purified polypeptide of claim 20 wherein the opioid compound is dynorphin A.

24. The mu opioid receptor polypeptide of Claim 19, wherein the polypeptide is a recombinant polypeptide.

25. The opioid receptor polypeptide of Claim 24 that comprises the amino acid residue sequence of SEQ ID NO:8.

26. An isolated and purified opioid receptor-like polypeptide.

27. The opioid receptor-like polypeptide of Claim 26, wherein the polypeptide is a recombinant polypeptide.

28. The opioid receptor-like polypeptide of Claim 26 that comprises the amino acid residue sequence of SEQ ID NO:17.

29. A recombinant host cell transfected with a polynucleotide that encodes a mu opioid receptor polypeptide or an opioid receptor-like polypeptide.

30. The recombinant host cell of claim 29, further defined as a eukaryotic host cell.

31. The recombinant host cell of claim 30, wherein the eukaryotic host cell is COS.

32. The recombinant host cell of claim 29, further defined as a prokaryotic cell.

33. The recombinant host cell of claim 32, wherein the prokaryotic host cell is *E. coli*.

34. The recombinant host cell of claim 29, wherein the polynucleotide is introduced into the cell by means of a vector.

35. The recombinant host cell of claim 34, wherein the host cell expresses the polynucleotide to produce the encoded polypeptide.

36. The recombinant host cell of claim 35, wherein the polypeptide includes an amino acid sequence essentially as set forth by a contiguous sequence from SEQ ID NO:8 or SEQ ID NO:17.

37. A process of preparing a mu opioid receptor polypeptide comprising:

(a) transfecting a cell with a polynucleotide that encodes said polypeptide to produce a transformed host cell;

(b) maintaining the transformed host cell under biological conditions sufficient for expression of the polypeptide; and

(c) preparing the receptor therefrom.

38. A method of using a polynucleotide that includes a mu opioid receptor polypeptide, comprising:

(a) preparing a vector in which a mu opioid receptor-encoding polynucleotide is positioned under the control of a promoter;

(b) introducing the vector into a recombinant host cell; and

(c) culturing the recombinant host cell under conditions effective to allow expression of the mu opioid receptor polypeptide.

39. The method of claim 38 wherein the mu opioid receptor polypeptide is a recombinant polypeptide.

40. An antibody immunoreactive with a mu opioid receptor polypeptide.

41. The antibody of claim 40, wherein the antibody is linked to a detectable label.

42. The antibody of claim 41, wherein the antibody is linked to a radioactive label, a flurogenic label, biotin, or an enzyme.

43. A process of detecting a mu opioid receptor polypeptide comprising:

(a) immunoreacting said polypeptide with the antibody of Claim 40 to form an antibody-polypeptide conjugate; and

(b) detecting the conjugate.

44. A process of screening a candidate substance for its ability to interact with a mu opioid receptor, said process comprising the steps of:

a) providing a mu opioid receptor polypeptide;

b) obtaining a candidate substance; and

c) testing the ability of said candidate substance to interact with said opioid receptor.

45. The process of claim 44, wherein the step of testing the ability of the candidate substance to interact with the opioid receptor involves determining whether the candidate substance binds to the receptor.

46. The process of claim 44 wherein the step of testing the ability of the candidate substance to interact with the opioid receptor involves determining the binding affinity of the candidate substance to the receptor.

47. The process of claim 44 wherein the step of testing the ability of the candidate substance to interact with the opioid receptor involves determining the intrinsic activation ability of the candidate substance for the receptor.

48. The process of claim 44 wherein the interaction between the mu opioid receptor polypeptide and the candidate substance is selected from the group consisting of:

a) binding of the mu opioid receptor to the substance;

b) activation of ion channels in a cell membrane;

c) modulation of ion channels in a cell membrane; and

d) modulation of cellular biochemical processes.

49. A process of screening a substance for its ability to interfere with opioid tolerance or dependence, said process comprising the steps of:

a) obtaining a candidate substance;

b) exposing a mu opioid receptor polypeptide to said candidate substance; and

c) measuring an interaction between the mu opioid receptor polypeptide and the candidate substance.

50. The process of claim 49 wherein the interaction tested is the receptor's ability to bind the candidate substance.

51. The process of claim 49, wherein the interaction tested is the receptor's binding affinity for the candidate substance.

52. The process of claim 49, wherein the interaction tested is the candidate's intrinsic activation of the receptor.

53. A method of screening substances for their ability to interact with a mu opioid receptor comprising the following steps:

a) obtaining a candidate substance;

b) exposing cells expressing a reporter gene under the control of a mu opioid receptor promoter to the candidate substance; and

c) measuring expression of said reporter gene in the presence and absence of the candidate substance.

54. The method of claim 53 wherein said reporter gene encodes beta-galactosidase.

55. The method of claim 53 wherein said reporter gene encodes chloramphenicol acetyltransferase.

56. A method for predicting individual responsiveness to medical intervention comprising:

a) analyzing the sequence content of an individual's genetic composition and determining sequence polymorphism; and

b) determining the functional impact of such polymorphins from information on a physiological characterization of the polynucleotide bearing the polymorphin.

57. The method of claim 56 wherein the sequence content is for mu opioid receptor gene.

58. The method of claim 56 wherein physiological characterization is mu opioid receptor binding to a substance.

59. The method of claim 56 wherein physiological characterization is a cellular process.

60. The method of claim 59 wherein the cellular process is a metabolic process.

61. The method of claim 60 wherein the metabolic process is the activity of adenylyl cyclase.

62. The method of claim 59 wherein the cellular process is ionic currents.

63. The method of claim 56 wherein the medical intervention is administration of an opioid compound.

64. The method of claim 63 wherein the opioid compound is a dynorphin, a dynorphin analog, bradynorphin metabolite.